Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

tween B and D. Now as regards B and D, and our fourth point A, either A is between B and D, or B is between A and D, or D is between A and B.

If B is between A and D, we have fulfilled the hypothesis of Theorems I and II. If D is between A and B, then interchanging the lettering for B and D, that is, calling B, D, and D, B, we have again fulfilled the hypothesis of Theorems I and II.

There only remains to consider the case where A is between B and D. If now C is between D and A we have fulfilled the hypothesis of Theorems I and II, by calling D, A, and C, B, and A, C, and B, D. If however A were between C and D we would have fulfilled the hypothesis of Theorems I and II by writing for A, B, for D, A, and for B, D.

We have only left one case to consider, that where D is between A and C. This case is impossible. Suppose $ABCD$ on a. Through C take a straight c other than a. On c take a point E other than C. On the straight DE between D and E take F. Thus between D and F is no point of c.

Then since by hypothesis C is between B and D, therefore c must (by II 5) have a point between B and F. Therefore we have the three non-co-straight points B, F, A, and c with a point between B and F. Therefore c has (by II 5) a point between B and A or a point between F and A.

But it cannot have a point between F and A, else it would (by II 5) have a point between F and D, contrary to our construction, or else between D and and A, giving C between D and A, contrary to our hypothesis D between A and C. So C would be between B and A, and D between A and C, and therefore (by Theorem II) D between A and B, contrary to our hypotheris A between B and D.

Thus there is always such a lettering that B is between A and C, and C between A and D, whence (by Theorem I) C is between B and D, and (by Theorem II) B is between A and D.

Austin, Texas, April 17, 1902.

DEPARTMENTS.

SOLUTIONS OF PROBLEMS.

ARITHMETIC.

155. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

A bought a horse, which he sold to B at a *loss* of $m=6\%$; B sold the horse to C at a *loss* of $n=6\%$; and C sold the horse to D at a *gain* of $p=12\frac{1}{2}\%$. How much did A *lose*, if C gained $\$G=\$26.79$?

Solution by J. R. HITT, Coronal Institute, San Marcos, Tex.

Let 100% = what horse cost A. Then $\frac{(100-6)(100-5)\times 12\frac{1}{2}}{(100)^2}$

$=94\times(.95)(.12\frac{1}{2})=.111625$ of what horse cost A = C's gain = \$26.79.

Hence A's loss $=\frac{\$26.79\times.06}{.111625}=\$14.40$.

Also solved by *G. B. M. ZERR*.

ALGEBRA.

136. Proposed by JOHN M. COLAW, A. M., Monterey, Va.

Solve $a^{x^2}b^{y^2}=c$....(1), and $c^{x+y}=ab$....(2).

Solution by G. B. M. ZERR, A. M., Ph. D., The Temple College, Philadelphia, Pa., and J. SCHEFFER, A. M., Hagerstown, Md.

Let $\log a=m$, $\log b=n$, $\log c=p$. Then $mx^2+ny^2=p$, and $px+py=m+n$. From which we easily get

$$x=\frac{n}{p}\pm\frac{1}{p}\sqrt{\frac{p^3-mn(m+n)}{m+n}},\quad y=\frac{m}{p}\mp\frac{1}{p}\sqrt{\frac{p^3-mn(m+n)}{m+n}}.$$

Solved in a similar manner by *H. C. WHITAKER*, and *L. C. WALKER*.

137. Proposed by MARCUS BAKER, U. S. Geological Survey, Washington, D. C.

Solve, if possible, $a^x+b^x=c$.

Solution by G. B. M. ZERR, A. M., Ph. D., The Temple College, Philadelphia, Pa.; LON C. WALKER, A. M., Petaluma High School, Petaluma, Cal.; and F. P. MATZ, Sc. D., Ph. D., Defiance College, Defiance, Ohio.

Let $\log a=m$, $\log b=n$. Then

$$a^x=1+mx+\frac{m^2x^2}{2!}+\frac{m^3x^3}{3!}+\frac{m^4x^4}{4!}+\ldots.$$

$$b^x=1+nx+\frac{n^2x^2}{2!}+\frac{n^3x^3}{3!}+\frac{n^4x^4}{4!}+\ldots.$$

Adding, $c-2=(m+n)x+\frac{m^2+n^2}{2!}x^2+\frac{m^3+n^3}{3!}x^3+\frac{m^4+n^4}{4!}x^4\ldots.$

By reversion of series,

$$x=\frac{c-2}{m+n}-\frac{(m^2+n^2)(c-2)^2}{(m+n)^3\,2!}+\frac{[3(m^2+n^2)^2-(m+n)(m^3+n^3)](c-2)^3}{(m+n)^5\,3!}$$

$$-\frac{[15(m^2+n^2)^2-10(m+n)(m^2+n^2)(m^3+n^3)+(m+n)^2(m^4+n^4)](c-2)^4}{(m+n)^7\,4!}+\ldots$$

Also solved by *WM. E. HEAL*, and *J. SCHEFFER*.